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Evaluation of Electrolyte Repletion and Infection Rates in Hematopoietic Cell Transplant Patients Receiving H-2 Receptor Antagonists or Proton Pump Inhibitors

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At Virginia Commonwealth University Health System, hematopoietic cell transplant (HCT) patients receive proton pump inhibitors (PPI) during their admission to prevent chemotherapy-induced gastroduodenal injury. Prior to 2012, most patients were also discharged on PPI to reduce the frequency of ulcers and upper gastrointestinal (GI) symptoms after HCT.

Adverse effects of PPI therapy may include magnesium deficiency, [1,2] increases in *Clostridium difficile* infection,[3] and an increased risk of community-acquired pneumonia.[4] Compared to PPI therapy, H-2 receptor antagonists (H2RA) have less pronounced and prolonged acid suppression which contributes to an advantageous side effect profile. Since HCT patients are subject to low electrolyte levels[5] and increased risks of infection at baseline, we sought to determine the association between PPI use and electrolyte repletion and infection rates and whether the use of H2RA was associated with reduced risk of these complications.

A retrospective, matched cohort study was conducted from September 30, 2010 through March 31, 2013. Patients 18 years or older receiving H2RA therapy post-HCT admission were matched by transplant type and preparatory regimen to patients receiving PPI. Matched pairs were evaluated for four weeks post-discharge. In addition to baseline characteristics, data collected included the amount and frequency of electrolyte repletion via a standard institutional protocol, rates of infection (positive cultures, use of antibiotics, radiologic evidence of pneumonia), and patient-reported GI symptoms. Data were analyzed with descriptive statistics, paired t-tests, and McNemar's Chi square test.

Twenty-six matched pairs were included. Patients receiving PPI required significantly more magnesium repletion in weeks 1, 3, and 4 post-discharge. During weeks 1, 3, and 4, significantly more patients receiving H2RA therapy went an entire week without repletion versus patients receiving PPI. Although the magnitude or frequency of potassium or calcium repletion were generally higher among PPI users, these differences were not statistically significant. The number of patients with evidence of infection was not significantly different between groups. Compared to patients on H2RA therapy, significantly more patients receiving PPI reported GI symptoms.

H2RA therapy deserves serious consideration in place of PPI, when possible, for HCT patients post-discharge.

References:

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Impact of Bone Marrow Transplant (BMT) Pharmacist (pharma) Interventions on Outcomes in Patients (pts) Undergoing Transplantation at an Academic Medical Center

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Background: Multidisciplinary collaboration leads to improvement in pt outcomes when clinical pharmas are engaged in various settings. Clinical pharma integration in the BMT setting has increased as these programs expand. There is an absence of literature defining the benefit of clinical pharma involvement in this area of practice. UMass Memorial Medical Center is a large academic medical center performing 108 allogenic transplants since 2010. In August 2010, the medical center implemented the integration of a health-system clinical pharma to the BMT team. This study aims to determine the impact of a health- system based clinical pharma on pt outcomes and associated costs in the BMT setting.

Methods: Records for pts receiving an allogeneic stem cell transplant (ASCT) from January 2008 to August 2012 were reviewed. The primary outcome measure was difference in length of stay (LOS) for ASCT prior to and after pharma integration on the BMT team. Secondary outcome measures include number of readmissions within 30 days, overall survival at 100 days, duration of intravenous (IV) antimicrobial therapy, duration of IV immunosuppressive therapy (IST), and duration of oral IST.

Results: 106 pts were identified and included for analysis. 45 were transplanted prior to pharmacist implementation and 61 were after BMT. Baseline demographics were similar between the two groups. In the pre and post group, the most common indication for transplant was AML (40% vs. 51%) and the most common source was a matched unrelated donor (60% vs. 62%). The majority of pts in both groups received myeloablative regimens (80% vs. 69%). LOS was decreased in the after group but was not statistically significant (24.8 vs. 22.9 days, $p = 0.43$). 100-day survival (80% vs. 88.5%, $p = 0.23$) and readmission within thirty days were not significantly changed (42.2% vs. 37.7%, $p=0.64$). Days of IV antibacterials, antivirals and antifungals were all decreased, but were not statistically significant. Days on IV IST were significantly decreased (21.4 vs. 11.3 days, $p=0.001$) showing a reciprocal increase in oral IST use (4.9 vs. 9.1 days, $p=0.001$). Costs benefits were assessed using 2013 WAC prices. Cost savings were reported as $3,083 per pt, for a total benefit since implementation of $184,985 or $92,493 per year.

Conclusion: Our analysis demonstrates significant improvements in cost saving with the implementation of a pharma in the BMT setting, specifically allogeneic pts. While